

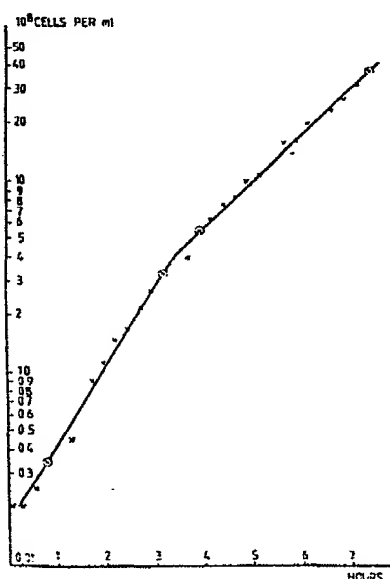
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(54) **A vaccine for combatting pleuropneumonia in pigs, and a process and a substrate for the aerobic fermentation of haemophilus pleuropneumoniae**

(57) In an improved method for combatting pleuropneumonia in pigs by administering a vaccine comprising cells of the known and generally available micro-organism Haemophilus pleuropneumoniae, parts of such cells, extracts and/or metabolism products thereof as the active ingredient, adjuvants and a buffer, the improvement consisting in the use of a Bordetella pertussis vaccine, biomass and/or extracts thereof as adjuvant, as well as the new H. pleuropneumoniae vaccine comprising a B. pertussis based adjuvant. The method and the vaccine result in an improved protection of the pigs against pleuropneumonia attacks without side-effects. Besides, a new and improved substrate called CAY-substrate for the cultivation of

microorganisms in particular the bacterium H. pleuropneumoniae, which compared to known substrates results in a substantially higher yield of biomass suitable for the production of a H. pleuropneumoniae vaccine, said substrate comprising casamino acid, yeast extract, glucose and NAD as essential ingredients and being suitable for cultivation of H. pleuropneumoniae on solid as well as in liquid media by slight modifications in the composition of the substrate. An improved process for the aerobic fermentation of H. pleuropneumoniae in a liquid medium comprising the new CAY-substrate, the fermentation being advantageously performed at a temperature of about 37°C., a pH of about 7.1 to 7.4, and at an oxygen concentration in the fermentation medium of about 8 to 12 ppm, thereby maintaining the desired oxygen concentration by variation of the stirring speed and/or of the air flow rate.



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